

Regional determinants of export competitiveness in Croatian manufacturing industry*

Nebojša Stojčić¹, Đuro Benić², Petra Karanikić³

Abstract

Aim of this paper is to investigate the impact of regional determinants on export competitiveness of Croatian companies in the manufacturing industry in the period from 2004 to 2010. Using the spatial econometrics the impact of agglomeration externalities, innovation potential, firm size, foreign ownership concentration and development of regions on the export competitiveness of companies in Croatian counties have been investigated for the first time. Research results indicate changes in the regional distribution of Croatian exports during the period. This trend has a negative impact on export competitiveness of companies in other counties. The basic conclusion suggests the need for revision of the existing and formulation of new measures in order to improve the export competitiveness of non-developed counties and to encourage the balanced regional development.

Key words: competitiveness, exports, regions, manufacturing, spatial econometrics

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¹ PhD, Assistant Professor, Department of Economics and Business Economics, University of Dubrovnik, Ćira Carića 4, 20000 Dubrovnik, Croatia. Scientific affiliation: competitiveness, firm behaviour, agglomeration externalities, restructuring, technology transfer, economics of innovation. Phone: +385 20 445 921. E-mail: nstojcic@unidu.hr.

² PhD, Full Professor, Department of Economics and Business Economics University of Dubrovnik, Ćira Carića 4, 20000 Dubrovnik, Croatia. Scientific affiliation: economic theory, firm restructuring, sustainable development. Phone: +385 20 445 928. E-mail: dbenic@unidu.hr. Personal web-page: www.durobenic.com.

³ PhD, Head of Technology Transfer Office University of Rijeka, Ulica Slavka Krautzeka 83 A, 51000 Rijeka, Croatia. Scientific affiliation: technology transfer, innovation management, intellectual property, FDI, competitiveness. Phone: +385 51 265 969. E-mail: pkaranikic@uniri.hr.

1. Introduction

The companies' ability to sell their products on the international market is often described as a precondition of their survival in the context of globalization. The rapid development of regional, continental and global economic associations opens the doors of domestic market to international companies and exposes their domestic competitors to a higher market pressure. At the same time domestic companies have an opportunity to participate on the other countries' markets and in that way have a possibility for rapid growth and the acquisition of knowledge and skills necessary to improve their competitiveness. The pressure of international competition both in the domestic and foreign markets leads to the changes in the traditional company boundaries. In search for ways of improving their competitiveness modern companies are turning forward the collaboration with their rivals and with professional and scientific institutions. This way of competitiveness rising is particularly important for small and medium sized companies considering the fact that participation on international market requires certain investments into knowledge, skills and capacities that are often irreversible in their nature and these companies do not have financial resources to invest in these activities.

Export competitiveness is of particular importance for scientists, economic policy makers and businessmen in small and open economies like Croatian. The pressure of international competition on domestic market in these economies requires companies to seek the key of their survival by competing on the other countries markets. In addition, the limited size of domestic market implies that in a certain moment national borders present the barrier for growth of these companies and at the same time are forced to go on the international market. The exporters' competitiveness in small and open economies is also important for their industry and national prosperity. Revenues generated through export are an important source of import payments for these economies. Participation on the international market leads to the vertical and horizontal spill-over effects through which export companies acquire knowledge and skills necessary for improvement of their competitiveness and which then they apply on domestic market. In that way they improve the competitiveness of their industries and, ultimately, the national competitiveness. The above argument gains even stronger importance in case of less advanced countries that are known as adopters of the foreign technology. Existing research suggests that the population of export-oriented firms in these countries is smaller than in frontier states which create their own technologies (Acemoglu, Aghion and Zilibotti, 2006). In former group of countries finding ways to increase export-intensity of their producers can pave the way for growth and prosperity.

The participation of companies on the international market was traditionally explained within the assumptions of the neoclassical approach to economy (Wagner, 1995). Recent contributions in this area, however, indicate that exporters' behaviour

is closer to the assumptions of the new theory of international trade and especially the New Economic Geography (NEG) (Yi and Wang, 2012). An important contribution of the latter approaches in explaining the exporters' behaviour is pointing out the role of market imperfections in international trade and stressing out the importance of cooperation between companies and their environments in building the international competitiveness. According to NEG regional approach factors like agglomeration externalities, quality of human capital and innovation capability are important determinants of companies' ability to compete (Krugman and Venables, 1999). The concentration of firms in particular geographic area leads to the creation of externalities such as easier access to information, knowledge sharing between companies, and collaboration between companies and scientific and professional institutions. According to the same approach, concentration of companies in a particular area has a positive effect on companies' location in the neighbouring areas and on their business results and export competitiveness.

Aim of this paper is to investigate the impact of regional policies on export competitiveness of Croatian companies in the manufacturing industry in the period from 2004 to 2010. Building from assumptions of New Economic Geography the research is built around hypothesis that regional features have beneficial impact on competitiveness of its exporters while at the same time they exhibit negative inter-regional impact. In this context, the research will identify spatial patterns of the exporters' location and identify the significance of factors like regional innovation potential and industrial structure, concentration of companies, intensity of foreign ownership and human capital in building of the regional export competitiveness. In order to achieve these objectives the spatial Durbin model will for the first time be applied to the data on Croatian companies taken from the Amadeus database. Based on the research results the guidelines for economic policy makers interested in export competitiveness of companies in the Croatian manufacturing industry will be formulated. The following section provides a theoretical framework for this study while the contributions of existing research on exporters' competitiveness are presented in third section. Spatial patterns of the location of exporters are analyzed in fourth section. The model and econometric analysis results are presented in fifth section. Final conclusions and guidelines based on research findings are presented in the sixth section.

2. Literature review

Over past decades a significant number of authors have tried to explain the behaviour of firms on international markets. The starting point of these microeconomic models is macroeconomic theories of international trade. Traditionally, international trade was explained within the assumptions of neoclassical economics according to which the superiority of particular companies over others is a transitory phenomenon

and international trade is of inter-industry type in nature (Krugman, Obstfeld and Melitz, 2014). Newer contributions in this area, also known as the “new” theory of international trade, suggest that market imperfections play an important role in international trade development as they lead to the occurrence of externalities such as scale economies and heterogeneity of consumer preferences (Linder, 1961, Krugman, 1980, Helpman and Krugman, 1985). The new theory of international trade suggests two main forms of trade of goods and services on the global market: an inter-industry which is characterized by comparative advantages described in the neoclassical model, and intra-industry form of international trade which occurs due to the differences in preferences and possibilities to realize the economies of scale due to the increased market size. At the same time, the existence of market imperfections enables the realization of continuous superiority of individual companies, industries or economies over others.

Microeconomic models of exporters’ competitiveness combine the assumptions of the “new” theory of international trade with the assumptions of the industrial economy, New Economic Geography, and contributions in understanding the behaviour of firms created within different theories. In one group of models the competitiveness of exporters is associated with the general determinants of their ability to compete with competitors like cost efficiency characteristic for cost-competitive industry, or factors such as innovation potential and productivity improvements that contribute to the ability to compete in intensive high-tech and sophisticated industries (Melitz, 2003; Costantini and Melitz, 2008; Singh, 2009; Iyer, 2010). Studies with the basis in the resource approach and transaction cost theory emphasize that participation on international markets requires the acquisition of certain knowledge, skills and capacities. For particular companies, especially small and medium-sized, access to these resources can be difficult. In this context, the company size, age or ownership structures are considered as firms’ characteristics which suggest the possibility of overcoming the barriers to export (Majocchi et al., 2005).

Among the ways of overcoming the barriers for participation on the international market, the literature on exporters’ behaviour devotes special attention to the assumptions of the New Economic Geography (NEG) on the impact of agglomeration externalities on companies’ competitiveness. The importance of companies’ location in particular areas for their business results was already recognized by Marshall (1920) according to whom the location in densely populated areas ensures a greater demand and achievement of scale economies and lowering the production and transport costs. Later contributions in this area suggest that the concentration of companies in a particular area benefits the creation of inter-industrial economies like easier access to infrastructure and lower transport costs (Krugman, 1980). Finally, the concentration of companies from particular industry in a particular geographic area leads to the intra-industrial economies like

easier access to specialized inputs, workers with relevant knowledge and skills, and technology and knowledge transfer between companies and professional and scientific institutions (Venables, 1996; Fujita, Krugman and Venables, 1999; Hafner, 2013).

Beside the impact on companies within a particular area, NEG also predicts the impact of companies' concentration in particular geographic area on companies and general economic activity in the neighbouring cities and regions. According to Fujita, Krugman and Venables (1999) the concentration of economic activity in particular regions enables the realization of above-average wages and returns that attract workers and companies from other regions. The consequence of these predictions is the economic development of so-called main (core) regions with economic deterioration of other (peripheral) regions. The agglomeration literature distinguishes between centripetal forces attracting firms to dense urban areas and centrifugal forces driving firms away from large urban centres because of the negative externalities and adverse effects on the firm's exporting behaviour. The former include access to upstream firms, better pool of skills and expertise and also better flow of information between firms which facilitates their access to up-to-date techniques. The latter include higher costs of labour and other inputs arising from geographical proximity of firms in one location (Krugman, 1980; Venables, 1996).

Other authors' analyses took into account the characteristics of companies that operate in certain regions, or their technological intensity. In this context, a regional structure that promotes knowledge-intensive competitiveness has a centripetal effect on companies from high-tech intensive and sophisticated industries (Lall, 2000). At the same time such regional structure leads to the increase of the labour costs and other inputs what has a centrifugal effect on the competitiveness of price (cost) competing companies which will be located in the regions which structure is more suited to their competitiveness profile. The above shows that regional determinants of companies' competitiveness determine not only the concentration of economic activity, but also affect the competitive companies' profiles concentrated in other regions.

Empirical researches of exporters' competitiveness suggest several stylized facts connected to these companies behaviour. First of all, there is a large body of evidence on the importance of companies' behaviour, whether it is to improve their cost efficiency, or to improve their competitiveness based on quality, on exporters' success (Smith et al. 2002; Wignaraja, 2008; Singh, 2009; Iyer, 2010). Other studies point out the importance of export experience suggesting the existence of the learning-by-exporting effect (Filatotchev et al., 2001; Bellone et al., 2010). Existing findings indicate the opposite results when it comes to the impact of the company size and age. While some studies suggest a positive impact of these factors on export (Stiebale, 2008; Bellone et al., 2010) in others this impact is negative (Singh, 2009; Iyer, 2010) or insignificant (Correa et al., 2007). Several authors

reported a positive impact of foreign ownership on exporters what suggests how the possibility of using networks, knowledge and other foreign owners' resources are helping domestic companies to overcome the aforementioned non-refundable export costs (Damijan et al., 2004; Wignaraja, 2008).

There are other factors which also influence companies' export activities. Research conducted by Yi and Wang (2012) based on empirical analysis of panel data set of 30,333 Chinese companies across 11 cities for the period of 2001-2003 in the industry of mining, manufacturing, and electricity, gas and water provided some interesting findings. The results show that sunk costs, labour quality, foreign ownership, industry competition and spatial concentration are positively associated with companies' decision to export. Company size and productivity are also positively associated with the export activities. Together with the finding of the significant role of sunk costs, larger and more productive companies will export more because of their capability to overcome the costs barriers.

Newer researches investigated the impact of technological change and innovation on export activities. Monreal-Perez et al. (2012) investigated the impact of innovation on company export activities. They conducted a longitudinal analysis of 14,142 observations of an annual average of 1767 Spanish companies within the manufacturing sector during the period from 2001 to 2008. Longitudinal studies allow researchers to study the dynamic relationship between innovation and the export activities of firms. Their results suggest that innovation motivates companies to increase their export activities. However, greater innovativeness of firms will only be important if the companies are able to overcome the sunk costs associated with their entrance on international market. An explanatory study and preliminary analysis conducted by Pereira et al. (2013) was applied to the four EU countries, namely Belgium, France, Germany and Italy, with the aim to evaluate the relationship between innovation and foreign trade measured with the annual growth rate of exports in production for several industrial manufacturing sectors over the period from 2000 to 2007. Results demonstrate that there is a positive connection between technological innovation and exports and export performance depends on technological improvement in every sector upon the ability to adapt, upgrade and enter innovative sectors.

Approach to the impact of spatial factors on exporters' competitiveness in majority of existing studies is based on the inclusion of control variables for the existence of localization and urbanization economies (Malmberg et al., 2000) and measuring the impact of locations in border regions, densely populated urban areas and industrial districts (Stiebale, 2008; Roberts and Tybout, 1997; Becchetti and Rossi, 2000). Results of these studies mostly indicate the existence of the positive effect of agglomeration externalities on the companies' ability to sell their products on the international market, although it does not take into account the effect of exporters' competitiveness from particular regions on exporting companies in neighbouring

regions. Analyzing the export of 48 US states and 24 Asian countries over a ten year period Nsiah Wu and Mayer (2012) came to the conclusion on the existence of spatial agglomeration effects. Results of this research suggest that countries (regions) which are geographically close to one another achieve similar export results considering that this effect was stronger in high-tech intensive export industries than in low-tech intensive industries.

Competitiveness of Croatian exporters was investigated by several authors (Mikić and Lukinić, 2004; Vukšić, 2006; Buturac, 2009; Stojčić and Hashi, 2011; Stojčić et al., 2012; Stojčić, 2012; Tkalec and Vizek, 2014). Results of these studies suggest that reductions in the labor costs, improvements of the productivity and inflow of foreign direct investment benefit the ability of Croatian companies to compete on international markets (Vukšić, 2006). Most of these studies were carried out on an industrial level and do not take into account the regional factors. In one of the rare studies that address these issues Stojčić (2012) suggests the existence of a positive and significant connection between export competitiveness and companies' location in Croatian manufacturing industry trade zones and in smaller urban areas while Tijanić (2010) finds that increase in exports positively contributes to the growth of regional GDP. However, there are no studies which are dealing with spatial determinants of export competitiveness on the regional level taking into account the potential of inter-regional spillover effects what is the aim of this paper.

3. Methodology and model of analysis

Research model of regional export competitiveness was developed based on the findings of existing researches and arguments presented in this paper. The general form of the model can be expressed as:

$$\text{Export intensity}_{it} = f(\text{Firm size}_{it}, \text{Ownership}_{it}, \text{Innovation potential}_{it}, \text{Localization economies}_{it}, \text{Urbanization economies}_{it}, \text{GDPpc}_{it}) \quad (1)$$

In the above equation the dependent variable is defined as regional export intensity or as ratio of total export revenues and total company revenue generated in a region i in a year t . This measure is usually used as an indicator of exporters' competitiveness on the microeconomic level (Singh, 2009; Iyer, 2010; Stojčić, 2012). Among the independent variables the model includes the average company size measured by the average number of employees. In accordance with the assumptions of the resource theory approach and transaction costs theory it is expected that larger companies have the necessary human and organizational resources and easier access to finance to overcome the barriers of accessing to the international market. Also, the possibility of failure increases the risk aversion of small companies and discourages them from export activities (Wagner, 1995;

Majocchi et al., 2005; Stojčić, 2012). Therefore, a positive sign is expected on this variable.

The concentration of foreign ownership in the region is defined as a ratio of revenues generated by foreign-owned companies and the total income generated in the same region in particular year. Many authors recognized the importance of foreign companies for competitiveness of domestic companies and industries in Central and Eastern Europe. Existing researches suggest that the spill-over effects from foreign to domestic companies in these countries range from restructuring (Djankov and Murrell, 2002) through productivity growth (Schadler et al., 2006) to improvement of export competitiveness (Rugraff, 2006). For these reasons a positive sign is expected on this variable.

Regional innovation potential is defined as the number of patent applications in each region. Evidence from a number of empirical studies suggests a positive impact of innovations on various dimensions of company performance (Crepon et al., 1998; Klette and Grilliches, 2000, Loof and Heshmati, 2006). Also, the innovation activity of particular companies leads to a spillover effects that have a positive impact on companies which are not engaged in innovation activities and on competitiveness of overall industry and region. Number of patent applications in particular region is usually considered as a measure of innovation output, or of a successful innovation process. Therefore, it is expected that a higher concentration of innovators within particular region has a positive impact on export competitiveness of its companies.

Among the measures of agglomeration externalities, the model includes measures of urbanization and localization economies. Urbanization externalities include a cross-sectoral agglomeration benefits like information sharing, easier access to institutions and resources (Woodward and Yoruk, 2005). Impact of these externalities on the regional export competitiveness is measured by the variable defined as a ratio of the total number of companies in particular region and the total number of companies in the country in a given year. Localization externalities include intra-industrial benefits like specific knowledge for particular industry, access to new technologies or information sharing on market conditions. They are measured by the variable defined as an average number of companies from particular industry in the region in relation to the total number of companies in the same region. A positive sign on both variables would suggest the usage of agglomeration externalities in building the companies' export competitiveness.

The last variable included in a model is a regional Gross Domestic Product per capita (GDP per capita). On the one hand this variable may be an indicator of regional development and suggests better infrastructure, access to technology and conditions of business performance that are conducive to development of export competitiveness. On the other hand the higher level of GDP per capita can be seen as an indicator of the higher purchasing power of the domestic population what in

turn suggests a higher domestic demand and access to financial and other resources necessary to overcome barriers for export. For these reasons it is expected a positive sign on this variable. The estimated model has the following form:

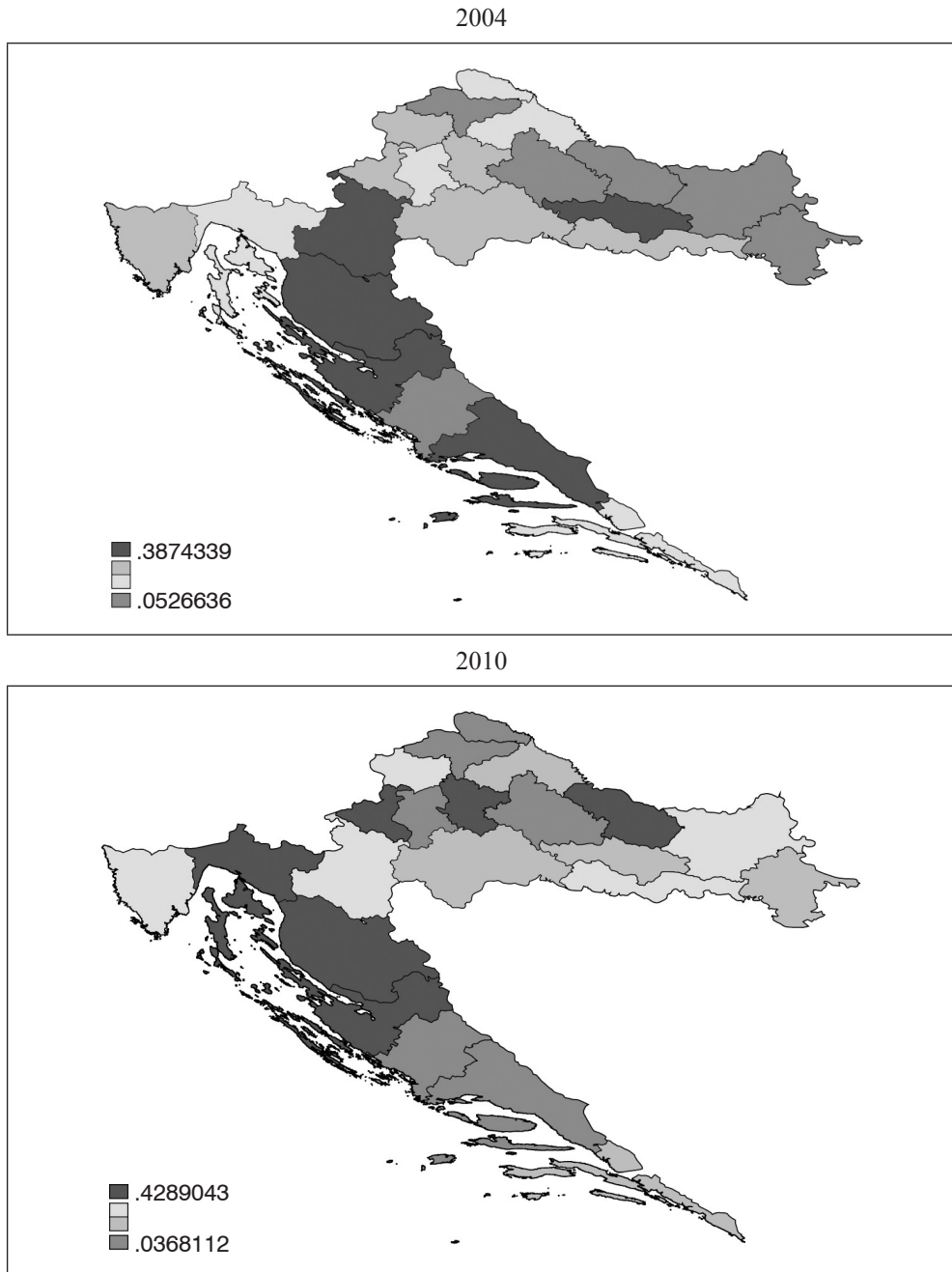
$$\begin{aligned} \text{Export intensity}_{it} = & c_0 + \rho \sum_{j=1}^n w_{ij} \text{Export intensity}_{jt} + \beta_1 \text{Firm size}_{it} + \beta_2 \text{Ownership}_{it} + \\ & + \beta_3 \text{Innovation potential}_{it} + \beta_4 \text{Localization economies}_{it} + \\ & + \beta_5 \text{Urbanization economies}_{it} + \beta_6 \text{GDPpc}_{it} + \theta_1 \sum_{j=1}^n w_{ij} \text{Firm size}_{jt} + \\ & + \theta_2 \sum_{j=1}^n w_{ij} \text{Ownership}_{jt} + \theta_3 \sum_{j=1}^n w_{ij} \text{Innovation potential}_{jt} + \\ & + \theta_4 \sum_{j=1}^n w_{ij} \text{Localization economies}_{jt} + \theta_5 \sum_{j=1}^n w_{ij} \text{Urbanization economies}_{jt} + \\ & + \theta_6 \sum_{j=1}^n w_{ij} \text{GDPpc}_{jt} + \lambda \sum_{j=1}^n \varepsilon_{jt} + u_{it} \end{aligned}$$

The spatial impact of dependent variable in the above equation is measured by coefficient ρ while the coefficients θ measure the spatial impacts of other variables on the export competitiveness of the region i in a period t . The coefficient λ controls for the impact of spatial autocorrelation in statistical error, while the estimated impact of other independent variables on dependent variable is shown by coefficient β . Standard statistical error is presented in the model through coefficient u_{it} . In defining the spatial matrix or modelling the positions of individuals in space related to one another, each element of the matrix W_{ij} is modeled as a distance between regional centres wherein each row of the matrix is standardized in a way that the sum of all its elements equals 1 (Le Sage, 1999; Baltagi et al., 2007; Olejnik, 2008).

4. Data and empirical analysis

In order to investigate the impact of regional factors on companies' export competitiveness in Croatian counties, the paper uses data from database Amadeus, largest Pan-European firm-level database providing information on more than 40 million companies. Information contained in this database includes the companies' location, ownership structure, industry in which companies operate number of employees, companies' age and the usual financial information about companies' business performance. For the purpose of this research data on exporters from the manufacturing industry in Croatia aggregated at the level of regions and counties covering the period from 2004 to 2010 were used. Figure 1 shows the export intensity defined as a share of export revenue in total company revenues at the beginning and at the end of the observed period.

Figure 1: The export intensity in Croatian regions in the period from 2004 to 2010



Source: Authors' calculation

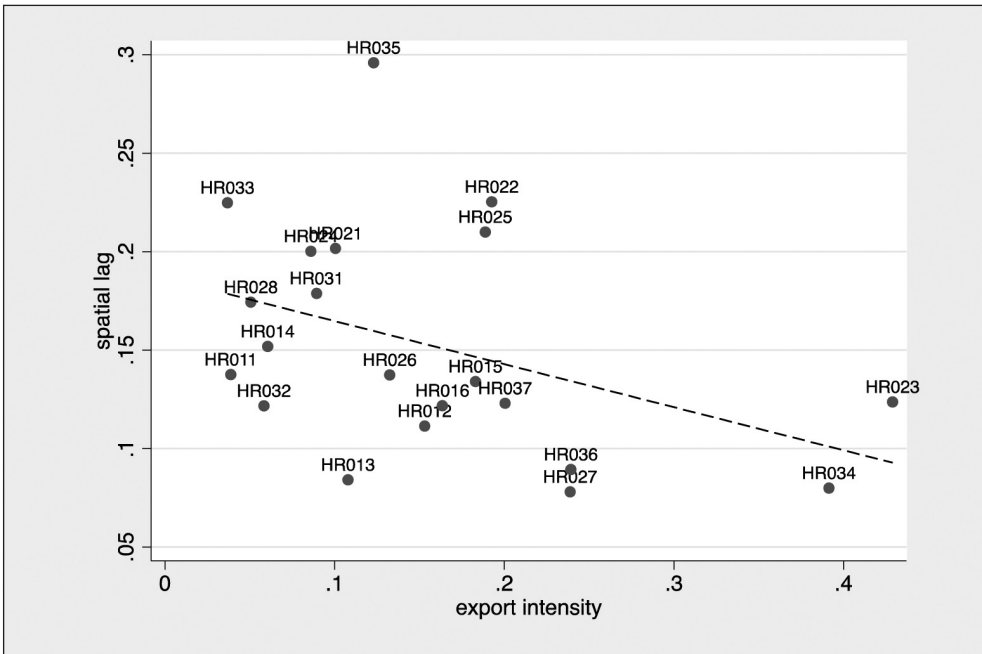
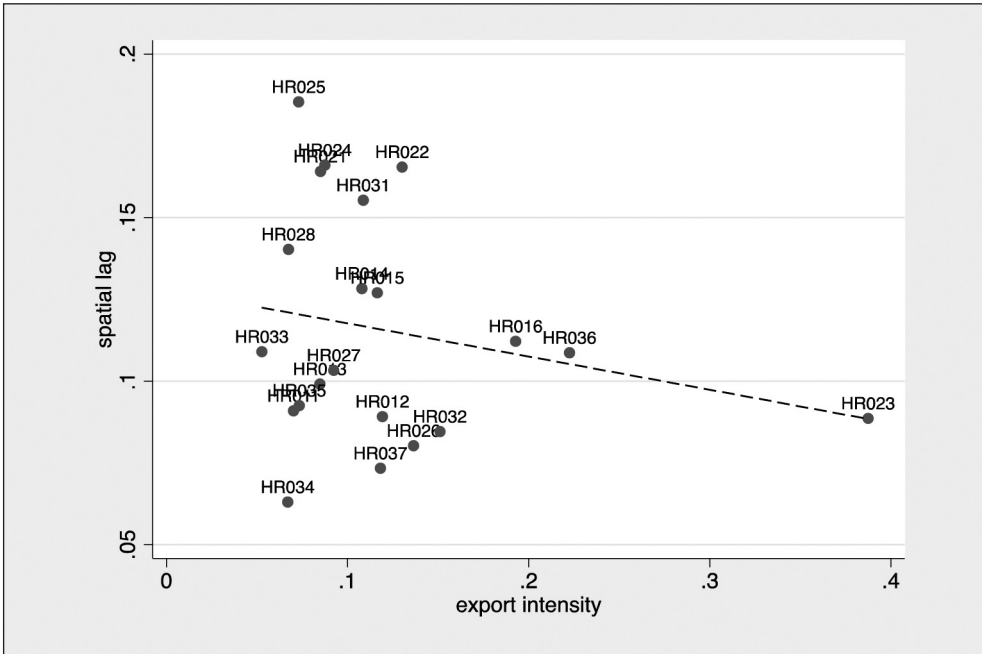
Figure 1 reveals several interesting facts about the Croatian regions export intensity. First of all, it is clear that the share of export revenues in total companies' revenues during the observed period varies between 3% and 40%. More interesting finding is the change in export intensity of particular regions or spatial redistribution of Croatian exports. In 2004, the share of export in companies' revenue was the largest in three Adriatic counties (Splitsko-dalmatinska, Zadarska and Ličko-senjska) and in Karlovačka and Požeško-slavonska County and followed by Istarska, Zagrebačka, Krapinsko-zagorska, Sisačko-moslavačka and Brodsko-posavska County. In 2010, most of these counties continued to lead in export competitiveness. Compared with the year 2004, there has been an increase in export intensity in Primorsko-goranska and Osječko-baranjska County what indicates the possibility of existence of spill-over effects from neighbouring export-oriented counties.

Preliminary analysis of spatial effects of export competitiveness existence was conducted by using the Moran diagram where the horizontal axis measures export intensity of particular regions and vertical axis its spatial shift (Anselin, 1996). Figure 2 shows Moran diagrams for 2004 and 2010.

Trend line in Moran diagrams in Figure 2 indicates the existence of a negative relationship between export intensity of particular regions and their spatial shift. This finding can be interpreted as evidence that export competitiveness improvement of particular regions has a negative impact on export competitiveness of neighbouring regions. As it was stated earlier, models within NEG predict such pattern of exporters' behaviour (Fujita, Krugman and Venables, 1999). Considering the export importance for small and open economies like Croatian further in the paper was explored the importance of selected determinants of regional export competitiveness.

Econometric analysis of the model presented in equation (1) was conducted with use of the spatial econometric techniques for the panel data estimation due to the fact that the aim of this paper is to investigate the existence of the spatial patterns of export competitiveness by observing the dependent variables movements in the period from 2004 to 2010. Selection of appropriate technique within the family of spatial estimators was based on analysis of relevant diagnostic criteria like the Lagrange (LM) test for the existence of spatial lag of dependent variable and spatial autocorrelation of statistical error, and subsequent testing of appropriate forms of spatial correlation through robust LM, Likelihood ratio and Wald tests (Elhorst, 2013). Model diagnostics are presented in Table 1. LR test results suggest that spatial estimators should get an advantage over conventional estimators and that spatial lag of independent and dependent variables together do not equal zero. Furthermore, all tests reject the hypothesis of non-existence of spatial autocorrelation in statistical error and also the hypothesis of non-existence of general spatial autocorrelation. The existence of spatial correlation of dependent variable was also confirmed by robust LM test.

Figure 2: Spatial patterns of Croatian counties export competitiveness (2004 and 2010)



Source: Authors' calculation

Table 1: Model diagnostics

Model	(1)
Number of observations	147
Number of regions	21
Log likelihood function	219.107
Wald test	199.53 ^{***}
LR TEST SDM vs. OLS $H_0: (\rho = 0)$	28.87 ^{***}
LR TEST $H_0: (wX's = 0)$	113.66 ^{***}
ρ	-1.19 ^{***}
Acceptable interval for ρ	$-2.26 < \rho < 1.00$
Test of spatial autocorrelation of statistical error H_0 : (no spatial autocorrelation)	
Global Moran MI	-0.15 ^{***}
Global Geary GC	1.19 ^{***}
Global Getis-Ords GO	0.15 ^{***}
Moran MI Error Test	-4.18 ^{***}
LM Error (Burrige)	11.10 ^{***}
LM Error (Robust)	23.11 ^{***}
Test of spatial lag of dependent variable H_0 : (no spatial autocorrelation)	
LM Lag (Anselin)	0.21
Lm Lag (Robust)	12.23 ^{***}
Test of general spatial autocorrelation H_0 : (no spatial autocorrelation)	
LM SAC (LMErr+LMLag_R)	23.32 ^{***}
LM SAC (LMLag+LMErr_R)	23.32 ^{***}

***, ** and * denote statistical significance at 1%, 5% and 10% significance level

Source: Authors' calculation

Model diagnostics presented in Table 1 suggest that the appropriate estimator for model used in this research is Durbin spatial panel estimator that takes into account the existence of spatial autocorrelation in dependent variable, independent variables and statistical error (Burrige, 1981). Together these findings enable us to proceed with presentation and discussion of results.

5. Results and discussion

Estimation results in Table 2 suggest that stronger export competitiveness of particular regions has a negative impact on other regions success on international markets, or provide support for assumption about the concentration of exporters in particular regions. As it was stated earlier, this finding is consistent with the assumptions of the New Economic Geography about negative impact of concentration of firms in particular region on economic activity of neighbouring regions.

Table 2: Estimation results

Variables	
Spatial lag of dependent variable	-1.19 ^{***}
Company size	-0.001 ^{**}
Ownership concentration	0.06
Innovation potential	0.002
Urbanization economies	-0.25
Localization economies	-1.01 ^{**}
GDPpc	0.01 ^{**}
Company size – spatial lag	-0.002
Ownership concentration – spatial lag	-2.08 ^{***}
Innovation potential – spatial lag	-0.02 ^{***}
Urbanized economies – spatial lag	-2.41 ^{***}
Localized economies – spatial lag	-25.46 ^{***}
GPDpc – spatial lag	-0.06 ^{***}
Constant	2.50 ^{***}

***, ** and * denote statistical significance at 1%, 5% and 10% significance level

Source: Authors' calculation

Analysis of intra-regional impact of particular factors reveals several interesting facts about Croatian exporters' behaviour. On the one hand, a higher level of Gross Domestic Product has a positive impact on the companies' ability to sell their products on international market. This finding indicates that greater regional demand and better infrastructure quality contribute to the exporters' competitiveness. On the other hand, company size and localization externalities have a negative impact on export competitiveness. The first finding can be interpreted as a signal of the small companies' success on the international market. One of the reasons for such results may be the flexibility of these organizations that offer the possibility of fast response to the challenges posed by the international market. The negative impact of localization externalities on the regional export competitiveness can be interpreted in the light of the above discussion on the impact of agglomeration externalities on companies from different industries and different technological intensity. As it was pointed

out, benefits of localized externalities are mainly directed to companies in the high-tech intensive activities which compete based on quality. Considering the previous findings on the competitive profile of Croatian exporters (Stojčić, 2012) according to which the majority of Croatian companies follow the price competitiveness, this finding can be understood as additional evidence in this direction.

Analysis of the spatial impact of independent variables on export competitiveness of Croatian regions provides further evidence of the Croatian exporters' regional concentration and the negative impact of this trend on the neighbouring regions. Except for the variable that measures the spatial lag of company size all other variables are significant with a negative sign. From the discussion above it can be concluded that the advantages which more developed regions provide to companies such as knowledge transfer, skills and technology through vertical and horizontal interactions with foreign companies, the possibilities of cooperation in innovation development and collaboration with other companies, academic and professional institutions have beneficial effect on the competitiveness of exporters. Also, access to basic infrastructure reduces the export intensity of their neighbouring regions what is further evidence in favour of the assumptions of New Economic Geography.

6. Conclusion

Research results indicate that the regional concentration of Croatian exporters has a negative impact on the companies' export intensity in neighbouring regions. Considering the importance of exports for small and open economies like Croatia, this finding can lead to a deepening of the inter-regional development gap between developed regions which attract exporters and less-developed regions characterized by lower export intensity. These findings also suggest that regions with smaller companies are more export-oriented and that Croatian exporters are still not using the advantages of agglomeration externalities in building their competitiveness. Particularly important finding is the evidence of negative impact on neighbouring regions from intra-regional improvements in factors that are usually labelled as drivers of regional competitiveness such as innovation potential, urbanization and localization economies. Hence, our expectations about beneficial impact of analysed factors on region itself and negative impact on other regions have been only partially confirmed.

While being innovative in many aspects our research has suffered from several limitations. On the one hand, the lack of relevant input-output tables prevented construction of FDI spill-over variables. As recognized in earlier literature, horizontal, forward and backward spill-overs are important channels for transfer of knowledge, skills and technology all of which have beneficial effect on ability of firms to export. Another limitation of our research is inability to assess dynamics

of exports, i.e. the importance of learning-by-exporting effect. These issues may be understood as directions for future research.

From these findings several guidelines can be formulated for economic policy makers. First of all, the findings indicate the need to formulate policies that will encourage equal dispersion of exporters in all Croatian regions (counties) to, thereby, encourage the achievement of cohesion, catching up of less-developed regions with developed ones and, ultimately, achieve the sustainable development. Findings related to the companies' size suggest the need to develop measures that will provide support to small and medium-sized companies in building their international competitiveness. Finally, findings of this paper suggest the need of revising the existing and developing of new measures that will encourage changes in the Croatian companies' competitive profile and regions from the price competitiveness towards the quality-driven competitiveness.

References

- Anselin, L. (1996) "The Moran Scatterplot as an ESDA Tool to Assess Local Instability in Spatial Association", *Spatial Analytical Perspectives on GIS*, Fischer, M., Scholten, H. i Unwin, D. (ed.) London: Taylor and Francis, pp. 111-125.
- Baltagi, B.H., Egger, P., Pfaffermayr, M. (2007) "Estimating Models of Complex FDI: Are There Third Country Effects?", *Journal of Econometrics*, 140 (1), pp. 260-281.
- Becchetti, L., Rossi, S. (2000) "The Positive Effect of Industrial District on the Export Performance of Italian Firms", *Review of Industrial Organisation*, 16 (1), pp. 53-68.
- Bellone, F. et al. (2010) "Financial Constraints and Firm Export Behavior", *World Economy*, 33 (3), pp. 347-373.
- Burridge, P. (1981) "Testing for a Common Factor in a Spatial Autoregression Model", *Environment and Planning*, 13 (7), pp. 795-800.
- Buturac, G. (2009) "Structural Characteristics of Exports and Imports of Croatian Manufacturing", *Ekonomski Pregled*, 60 (9-10), pp. 432-457.
- Correa, P., Dayoub, M., Francisco, M. (2007) "Identifying Supply-Side Constraints to Export Performance in Ecuador: An Exercise With Investment Climate Survey Data", *World Bank Policy Research Working Paper* (4179).
- Costantini, J. A., Melitz, M. (2008) "The Dynamics of Firm-Level Adjustment to Trade", *The Organization of Firms in a Global Economy*, Helpman, E., Marin, D. Verdier, T. (ur.), Cambridge, MA: Harvard University Press.
- Crepon, B., Duguet, E., Mairesse, J. (1998) "Research, Innovation, and Productivity", *NBER Working Paper* No. 6696.

- Damijan, J., Polanec, S., Prasnikar, J. (2004) "Self-selection, Export Market Heterogeneity and Productivity Improvements: Firm Level Evidence from Slovenia", *LICOS Discussion Papers (14804)*.
- Djankov, S., Murrell, P. (2002) "Enterprise Restructuring in Transition: A Quantitative Survey", *Journal of Economic Literature*, 40 (3), pp. 739-792.
- Elhorst, J.P. (2013) "Spatial Panel Models", *Handbook of Regional Science*, Fischer, M.M., Nijkamp, P. (ur.), Berlin: Springer-Verlag, pp.1637-1652.
- Filatotchev, I. et al. (2001) "Effects of Post-Privatization Governance and Strategies on Export Intensity in the Former Soviet Union", *Journal of International Business Studies*, 32 (4), pp. 853-871.
- Fujita, M., Krugman, P., Venables, J. (1999) *The Spatial Economy: Cities, Regions, and International Trade*, Cambridge, MA: MIT Press.
- Hafner, K. (2013) "Agglomeration Economies and Clustering - Evidence from German Firms", *Applied Economics*, 45(20), pp. 2938-2953.
- Helpman, E., Krugman, P. (1985) *Market Structure and Foreign Trade Increasing Returns, Imperfect Competition, and the International Economy*, Cambridge, MA: MIT Press.
- Iyer, C. (2010) "The Determinants of Firm-Level Export Intensity in New Zealand Agriculture and Forestry", *Economic Analysis and Policy*, 40 (1), pp. 75-86.
- Klette, T. J., Griliches, Z. (2000) "Empirical Patterns of Firm Growth and R&D Investment: A Quality Ladder Model Interpretation", *Economic Journal*, 110 (463), pp. 363-87.
- Krugman, P., Obstfeld, M., Melitz, M. (2014) *International Economics: Theory and Policy, 10th edition*,. Upper Saddle River: Prentice Hall.
- Krugman, P. (1980) "Scale Economies, Product Differentiation and the Pattern of Trade", *American Economic Review*, 70 (5), pp. 950-59.
- Lall, S. (2000) "The Tehnological Structure and Performance of Developing Country Manufactured Exports", *Oxford Development Studies*, 28 (3), pp. 337-369.
- Le Sage, J.P. (1999) "The Theory and Practice of Spatial Econometrics", *Working Paper*, University of Toledo, Department of Economics.
- Linder, S. B. (1961) *An Essay on Trade and Transformation*. New York: John Wiley & Sons.
- Loof, H., Heshmati, A. (2006) "On The Relationship Between Innovation and Performance: A Sensitivity Analysis", *Economics of Innovation and New Technology*, 15 (4), pp. 317-344.
- Majocchi, A., Bacchiocchi, E., Mayrhofer, U. (2005) "Firm Size, Business Experience and Export Intensity in SMEs: A Longitudinal Approach to Complex Relationships", *International Business Review* (14), pp. 719-738.
- Malmberg, A., Malmberg, B., Lundequist, P. (2000) "Agglomeration and Firm performance: Economies of Scale, Localisation and Urbanisation among Swedish export Firms", *Environment and Planning, A* 32 (2), pp. 305-321.

- Marshall, A. (1920) *Principles of Economics*, 8th Edition, London: Macmillan and Co.
- Melitz, Mark J. (2003) "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity", *Econometrica*, 71 (6), pp. 1695-1725.
- Mikić, M., i Lukinić, G. (2004) "Using Trade Statistics to Gauge Croatian Competitiveness", *2nd International Conference "An Enterprise Odyssey: Building Competitive Advantage"*, Zagreb.
- Monreal-Perez, J., Aragon-Sanchez, A., Sanchez-Marin, G. (2012) "A longitudinal study of the relationship between export activity and innovation in the Spanish firm: The moderating role of Productivity", *International Business Review*, 21 (5), pp. 862-877.
- Nsiah, C., Wu, C., Mayer, W. (2012) "An Analysis of US State's Export Performance in the Asian Market", *The Annals of Regional Science*, 49 (2), pp. 533-550.
- Olejnijk, A. (2008) "Using the Spatial Autoregressively Distributed Lag Model in Assessing the Regional Convergence of Per-Capita Income in the EU25", *Papers in Regional Science*, 87 (3), pp. 371-384.
- Pereira, E. T., Cerdeira Bento, J. P., Priede, J. (2013) "The Contribution of Technological Change on EU's Exports", *Procedia – Social Behavioral Sciences*, 99, pp. 658-664.
- Roberts, M. J., Tybout, J. R. (1997) "The Decision to Export in Columbia: An Empirical Model of Entry with Sunk Costs", *The American Economic Review*, 87 (4).
- Rugraff, E. (2006) "Export-oriented multinationals and the quality of international specialization in Central European countries", *The European Journal of Development Research*, 18 (4), pp. 642-660.
- Schadler, S. et al. (2006) *Growth in Central and Eastern European countries of the European Union*, Washington: International Monetary Fund.
- Singh, D. A. (2009) "Export Performance of Emerging Market Firms", *International Business Review*, 18 (4), pp. 321-330.
- Smith, V., Madsen, E., Dilling-Hansen, M. (2002) "Do R&D Investments Affect Export Performance?", *CIE Discussion Papers (2002-09)*.
- Stiebale, J. (2008) "Do Financial Constraints Matter for Foreign Market Entry? A Firm Level Examination", *Ruhr Economic Paper 51*, Essen.
- Stojčić, N., Hashi I. (2011) "The Structure and Quality Upgrading of Croatian Exports to EU15 Market", *9th International Conference Challenges of Europe: Growth and Competitiveness – Reversing the Trends*, Split: Faculty of Economics.
- Stojčić, N. (2012) "The Competitiveness of Exporters from Croatian Manufacturing Industry", *Ekonomski pregled*, 63 (7-8), pp. 424-445.
- Stojčić, N., Bečić, M., Vojinić, P. (2012) "The competitiveness of exports from manufacturing industries in Croatia and Slovenia to the EU15 market: A dynamic panel analysis", *Croatian Economic Survey*, 14 (1), pp. 69-105.

- Tijanić, L. (2010). Regional (Un)Competitiveness in Republic of Croatia, *Ekonomski Pregled*, 61(7-8), pp. 419-454.
- Tkalec, M., Vizek, M. (2014) "Real Estate Boom and Export Performance Bust in Croatia", *Zbornik Radova Ekonomskog Fakulteta u Rijeci*, 32 (1), pp. 11-34.
- Venables, A. (1996) "Equilibrium Locations of Vertically Linked Industries", *International Economic Review*, 37 (2).
- Vukšić, G. (2006) "Impact of Foreign Direct Investment on Croatian Manufacturing Exports", *Institute of Public Finance Occasional Paper No. 27*.
- Wagner, J. (1995) "Exports, Firm Size and Firm Dynamics", *Small Business Economies*, 7 (1), pp. 29-39.
- Wignaraja, G. (2008) "Foreign Direct Investment, Innovation, and Exports: Firm-Level Evidence from People's Republic of China, Thailand, and Philippines", *ADB Economics Working Paper Series (134)*.
- Woodward, R., Yoruk, D. (2005) "Actors and Factors behind Changes in Enterprise Competitiveness: the Experience of Five Cohesion Countries (a Literature Review)", *Sixth international conference Enterprise in Transition Proceedings*, Split: Faculty of Economics.
- Yi, J., Wang, C. (2012) "The decision to export: Firm heterogeneity, sunk costs, and spatial concentration", *International Business Review*, No. 21, pp. 766-781.

Regionalne odrednice izvozne konkurentnosti hrvatske prerađivačke industrije

Nebojša Stojčić¹, Đuro Benić², Petra Karanikić³

Sažetak

Nedavna istraživanja ukazuju kako regionalni činitelji poput aglomeracijskih eksternalija, kvalitete ljudskog kapitala i inovacijskog potencijala imaju važnu ulogu u objašnjavanju sposobnosti poduzeća da se natječu na domaćem i inozemnom tržištu. Nova ekonomska geografija sugerira kako koncentracija poduzeća u određenom zemljopisnom području pogoduje nastanku eksternalija poput lakšeg pristupa informacijama, dijeljenja znanja između poduzeća, suradnje poduzeća sa znanstvenim i profesionalnim institucijama te na taj način olakšava svladavanje prepreka građenju izvozne konkurentnosti. Prema ovom pristupu koncentracija poduzeća unutar pojedinog zemljopisnog područja ima negativan utjecaj na rezultate poslovanja poduzeća u susjednim zemljopisnim područjima uključujući i njihovu izvoznu konkurentnost. Cilj ovog rada je istražiti utjecaj regionalnih činitelja na izvoznu konkurentnost hrvatskih poduzeća iz prerađivačke industrije u razdoblju od 2004. do 2010. godine. Korištenjem metoda prostorne ekonometrije po prvi put će se istražiti utjecaj aglomeracijskih eksternalija, inovacijskog potencijala, veličine poduzeća, koncentracije stranog vlasništva i razvijenosti regija na izvoznu konkurentnost poduzeća iz hrvatskih županija. Rezultati istraživanja ukazuju na promjene u regionalnoj rasprostranjenosti hrvatskih izvoznika tijekom promatranog razdoblja. Ovaj trend ima negativan utjecaj na izvoznu konkurentnost poduzeća u ostalim regijama. Rezultati istraživanja također ukazuju na potrebu revizije postojećih i formuliranja novih mjera ekonomske politike kako bi se unaprijedila izvozna konkurentnost manje razvijenih regija te kako bi se potaknuo ravnomjeran regionalni razvoj.

Ključne riječi: konkurentnost, izvoz, regije, prerađivačka industrija, prostorna ekonometrija

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¹ Docent, Odjel za ekonomiju i poslovnu ekonomiju, Sveučilište u Dubrovniku, Ćira Carića 4, 20000 Dubrovnik, Hrvatska. Znanstveni interes: konkurentnost, ponašanje poduzeća, aglomeracijske eksternalije, restrukturiranje, transfer tehnologije, ekonomika inovacija. Tel.: +385 20 445 921. E-mail: nstojcic@unidu.hr.

² Redoviti profesor, Odjel za ekonomiju i poslovnu ekonomiju, Sveučilište u Dubrovniku, Ćira Carića 4, 20000 Dubrovnik, Hrvatska. Znanstveni interes: teorijska ekonomija, restrukturiranje poduzeća, održivi razvoj. Tel.: +385 20 445 928. E-mail: dbenic@unidu.hr. Osobna web stranica: www.durobenic.com.

³ Dr.sc., Voditeljica Ureda za transfer tehnologije, Sveučilište u Rijeci, Ulica Slavka Krautzeka 83 A, 51000 Rijeka, Hrvatska. Znanstveni interes: transfer tehnologije, upravljanje inovacijama, intelektualno vlasništvo, inozemne direktne investicije, konkurentnost. Telefon: +385 51 265 969. E-mail: pkaranikic@uniri.hr.